

**A.C. (Nelson)** asks if there are two types of 171A valves, as he has seen in the "Guide" where one uses 1½ volts a.c. on the filament, and the other 5.

**A.:** Volts in the text should of course read watts. The table makes this clear.

**2.** What is the difference in construction of a power and a 201A type valve?

**A.:** The main points of difference are the longer and thicker filament in power valves, the grids, which in general purpose valves are of thin wire and close together, and the distance of the grid from the filament, for the smaller this is the greater will be the amplification and the less the ability to handle strong signals. The size of the plate has a very big effect on the valve for power valves usually have much larger than general purpose ones. A larger plate made hotter by greater voltage draws more current.

**3.** How are the differences in impedances arranged?

**A.:** They are due to the spacing of the elements and the size of the grid and filament.

**4.** Is it on account of different valves being filled with different gases that the impedances vary?

**A.:** Only in special valves is there any gas. Almost invariably in general receiving valves there is a vacuum.

**DIAMOND (Christchurch)** asks which valves should be used in an a.c. receiver.

**A.:** We do not draw comparisons between commercial products. The three types of valves mentioned by you are quite good, but in the case of the non-American valves see that you get the exact American equivalent if you decide to use that make.

**E.J.S. (Takaka)** has a five-valve commercially-built r.c.c. receiver. There is no C battery and reception is weak. How could the signals be strengthened, and how can a C battery be added?

**A.:** It appears as though one of the grid leak resistances used in the r.c.c. amplifier has broken down, and without a supply of these to test by trial and error, or an accurate instrument, it would not be easy for you to locate the trouble. If you wish to experiment buy a few grid-leaks of the following values: 100,000 ohms., 250,000 ohms., and ½-megohm. Try these in place of

those already in the set. To insert a C battery find the grid return of the last valve, that is "F" or "C—" on the last audio transformer. It will be the only connection running from this piece of apparatus to A—. Break the connection and attach enough leads to reach to the C battery. If you use a medium power valve in the last stage you will need about 9 volts bias, and with a suitable battery connect C+ to A—, and C— to the grid return of the last valve.

**2.** My valves are about 12 months old. Would this cause the drop in volume?

**A.:** No doubt it would have an effect. We think the real trouble lies in the resistances.

**3.** The makers stipulate 201a's. Will 221's do?—Yes.

**4.** Would an H.R. 4-valve receiver do better?

**A.:** It should do.

**5.** What is the value of a condenser with six moving and seven stationary plates 3in in diameter?

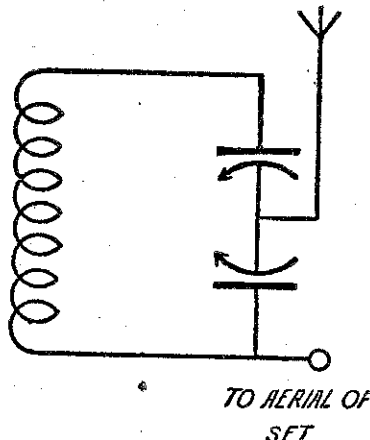
**A.:** Probably .00025.

**MICRO-AMP (Gisborne)** asks for data on resistances to convert a 0-25 volts a.c. meter (26 ohms per volt) to 250, 500, 750, and 1000 ranges.

**A.:** The following resistances are required: 6250 ohms, 12,500, 18,750, 25,000. These will be approximately correct to about 4 per cent.

**2.** Will the resistances require to be non-inductively wound?—Yes.

**3.** What would be the resistances to use with a 0-250 volt 1000 ohms per volt



This circuit should help the correspondent who is experiencing selectivity trouble.

d.c. meter to increase the range to 500, 750 and 1000?

**A.:** 250,000, 500,000, 750,000, 1,000,000 ohms. Each would be required to pass no more than one mil.

How would a meter reading 0-10-100 mils. be increased to read 100, 200, and 500 mils.?

**A.:** We could not tell you this without finding the resistance of the moving parts of your meter. This would be probably a few ohms or less. The best method is to shunt a 0-10 rheostat across the terminals and adjust it until it reads correctly to your requirements. One method of doing this is to arrange the meter in circuit so that the full drain is passing through it, then connect the meter in parallel and adjust it until the reading is some fraction of the whole. The range can then be recalibrated.

Where can one procure accurate resistances?

**A.:** Of those you mention the Electrad can be procured from at least Ballinger and Sons, Wellington, and Johns Ltd., Auckland, but they are probably procurable at most dealers.

**J.H.C. (Sandringham)** would like to hear from any Auckland constructors who have made eliminators or similar apparatus described in the "Record." He would like to compare notes for mutual advantage. His address is "J.H.C., c/o Fresno Press, 25 Swanson Street, Auckland." Telephone 45-393.

**CURIOUS (Westland)**—Is it possible and practicable to connect earphones to an all-electric 8-valve receiver?

**A.:** It is quite possible, and can be done by first locating the voice coil of the dynamic speaker. Trace this back to the stepdown transformer, and from the set side if this brings out two leads. These must be taken through the primary of a 1-1 transformer, and the secondary can be led off to the phones. The voice coil goes to the cone of the speaker.

**2.** Can you tell me which two sets you would favour from the following (and here the correspondent enumerates several well-known receivers)?

**A.:** We cannot differentiate between factory-made machines. It is even difficult to tell you their characteristics unless we know the particular models to which you refer. We have tested and reported on B, but have no technical data on the others.

**L.W.S. (Te Awamutu)** asks how a cone-speaker might be connected to an a.c. Console set.

**A.:** See the reply to the above correspondent.

**T.H.C. (Runanga)** asks concerning the crystal and two-stage amplifier described in the 1929 "Guide," whether the crystal is connected into No. 3 tapping.

**A.:** No, the crystal is connected to No. 2, and the speaker to Nos. 3 and 4. Disregard Nos. 1 and 5. By doing this your amplifier should work.

**BATTERY (Hokianga)** asks if it would be possible to add an additional screen-grid stage to a 4-valve Browning-Drake.

**A.:** Yes, the data in the 1929 "Listeners' Guide" should be sufficient. It would be possible for you to find out the circuit constants from the 2 r.f. Browning-Drake and the adapted screen-grid Browning-Drake.

**2.** We are supplied with 230 v.d.c. mains. Would it be possible to convert this set to an all-electric, and what would roughly be the cost.

**A.:** As we announced previously, we shall describe a d.c. eliminator for "A," "B," and "C" batteries. We publish with it directions for making a completely mains-operated d.c. set. This we will publish in a fortnight. Unfortunately we cannot tell you definitely the cost, but it should be about £3. You could use a rotary converter and an a.c. set, but the cost would be about £20.

**M. (Napier)** enclosed two stalled stampings, and wants to know if these will do in the Lofting-White amplifier.

**A.:** They can be used for the power transformer and the choke if they are regarded as 1½ in. stampings. The same number of turns will apply as have been given for this in the 1930 "Guide."

**2.** Could the transformer and a choke be made following the directions in the "Guide" without further directions for using this type of core stamping.

**A.:** The stampings in the "Guide" are a different shape. You would need first to work out the amount of space your transformer will take, but it should go into the window provided quite easily. The core is assembled by pushing the centre leg of the larger stamping through the centre of the wire, and then from the other side pushing in the short one until they meet. The spool of course will be 1½ x 1½ x the length of the window. The second layer of stampings will be arranged so that the short leg falls over the longer one. 1/t is then an alteration of short and long on each side. Shellac the stampings well and the transformer should be quite a good one. Before putting the power on to the filaments of your a.c. valves, borrow an a.c. volt-meter or a moving iron d.c. meter, and test the low voltage delivered.

**Note.**—We are sorry we could not answer your question before, but there were about 50 in ahead of you, and each inquirer must take his turn.

**PUZZLED (Auckland)** wants to know the current taken by his 5-valve set.

**A.:** You could have looked this up from the "Radio Guide." We make it to be about 14 mils if you have the maximum voltage and the appropriate bias.

**2.** I am using an electrolytic "B" power suit rated at 135 volts, 40m amps. Is this sufficient, at when I turn on the r.f. valves the loudspeaker makes a throaty noise.

**A.:** It should be quite satisfactory providing the solution is kept up to the right strength. For further information on electrolytic elimination see a dealer who handles them.

**W.F.H. (Westport)** wishes to know the voltage delivered from 3002 eliminator.

**A.:** This depends upon the drain. It will deliver 150 volts at 30 mils, maximum tapping. We cannot tell you what each tapping will give unless the drain is known. For a pamphlet on this eliminator write Philips Lamps, Hope Gibbons Buildings, Wellington.

**2.** Can I charge an "A" battery by adding a Bell stepdown transformer to the high voltage tapping of the above eliminator.

**A.:** No. You would require a separate transformer and a rectifier. The current delivered by the tapings on your eliminator is d.c. and you could not step it down with a transformer. It could be broken down with a resistance, but it would not supply nearly current enough to charge your "A" battery. A "B" eliminator and "A" battery charger combination can be obtained. The New Zealand agents are J. A. Smyth and Co., Victoria Street, Wellington.

**3.** Where might I obtain test tubes for making the wet "B" batteries?

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Name of set .....  
Number of Valves .....  
Name .....  
Address .....

Nom de plume .....

To be kept in subsequent inquiries.

Date .....

Please Note:—

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- (2) Write legibly, and on one side of the paper.
- (3) We do not design circuits, but accept suggestions for feature articles.

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